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⑮ 発明の名称 歯列印象により撮影部位位置決め方法およびその装置

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明 細 書

1. 発明の名称

歯列印象により撮影部位位置決め方法およびその装置

2. 特許請求の範囲

(1) 支持台上の傾斜可能な咬合器に歯列を複製した歯型を取付け、前記支持台に取付けたゲージ台からのビーム、インジケータライン等の位置決め手段によって歯型を位置決めし、ゲージ台に交換して支持台に取付けた歯列印象取付具に、前記咬合器の歯型に合わせて採取されている歯列印象を接着剤等の固定手段で固定し、この歯列印象取付装置を前記支持台から取外して断層撮影装置に取付けることを特徴とする歯列印象による撮影の位置決め方法。

(2) 支持台に設けられて傾動手段により任意の角度傾けて固定でき、歯列を複製した歯型を取付ける咬合器と、前記支持台上に着脱可能で、撮影断層面を表示するビーム発光器と、インジケータライン等の位置決め手段を備えたゲージ台

と、該ゲージ台に代えて前記支持台上に取付けられる断層撮影の際の歯列印象を取付ける歯列印象取付具とを備えたことを特徴とする歯列印象により撮影の位置決め装置。

3. 発明の詳細な説明

(産業上の利用分野)

本発明は断層レントゲン撮影を行う際に、患者の顎部を固定させるため、患者に咬ませる歯列印象を、レントゲン撮影装置に取付ける歯列印象取付具の所要の位置、角度に接着剤等の固定手段で取付け、歯列印象により撮影の位置決め方法およびその装置に関する。

(従来の技術)

従来、断層レントゲン撮影を行う際、患者の顎部を固定するため、患者の顎をチンレストと呼ばれる顎台に載せさせたり、顎を仰えたり、耳の孔を基準にする等の方法がとられてきた。

(発明が解決しようとする課題)

しかし、これ等の方法は何れも用途部位患者の皮膚表面を基準とするので、撮影中に患者が動い

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移動させ位置を設定する。

次に、断層面を示すビーム光15に対して歯型の所要の部位が必要な角度、例えば垂直になるようにつまみ5を回転して傾動基台4を傾ける。

このようにして、下顎歯型6をゲージ台A(インジケータライン14aおよびビーム光15で示される断層面)に対して、所要の位置(向き、傾き)に設定した後、下歯型固定台7を傾動基板4に固定する。

固定完了後、取付台13からつまみ11を回してゲージ台Aを取り外す。

そして、取付台13には、ゲージ台Aに代えて、第4図～第6図に示す歯列印象取付具Bが取り付けられる。

この歯列印象取付具Bは、例えば、下顎歯列6と凹凸を逆にした歯列印象を取付ける取付板16がつまみ17の操作によって着脱できるようになっている。

この取付板16は、第9図、第10図のように下顎歯型6が傾けられていても、同じように傾い

ている歯列印象が容易に取り付けられるように、歯列印象の取付部16aが軸18によって左右に拡開できるようにするのが望ましい。

又、その形状としては、第11図のようなものにすることもできる。

この取付板16は、つまみ19を有するネジ20によって左右に、つまみ21を有するネジ22によって前後に、そのつまみ19、21を回転することによって移動できる。

従って、このつまみ19、21を操作して、取付板16の歯列印象の取付部16aを下顎歯列6と一致する位置とすることができる。

尚、第4図～第6図は上顎歯型8もしくは下顎歯型6が取り付けられ、上顎部位の断層の場合には取付部16aに、上顎歯型8の歯列印象を上面に、(下顎および顎関節部位の断層の場合には)下顎歯型6の歯列印象を下面に、接着剤により接着する。

その接着の硬化を待って、歯列印象取付具Bを取付台13から取り外し、これを第7図、第8図

のように、X線撮影装置Cの取付部Cに取付ける。

そして、その歯列印象を患者に咬ませることにより、レントゲン撮影装置CのX線発生装置C2およびその受像装置C3に対し、患者の顎部は、下歯列固定台7(若しくは)上歯列固定台9で設定した下顎歯列6(または)上顎歯列8の傾き、(位置)向きとすることができるものである。

尚、C4は、患者が歯列印象を咬む際に、体を支える一助とすべく、患者が握る握り棒である。

このようにして、患者の顎部を固定した後、X線発生装置C2、およびその受像装置C3を顎部の周囲に回動させ、その回動の間に撮影を行うことにより、断層レントゲン撮影を行うものである。

また、つまみ19及び21により設定した歯列印象取付具16の前後左右の位置は目盛が施されているので、この数値と印象を接着した歯列印象取付部16aを保存しておくことにより、何時でも撮影位置等条件を再現する事が可能となる。

本発明は、前記したように、歯科における顎骨の固定の他に、歯列の顎関節との関係、或いは耳

鼻との位置関係により(撮影希望部位の断層面への)位置決めを併用するのも可能であり、歯列部のみならず顎関節や耳鼻科等での断層撮影やパノラマ撮影に使用できるものである。

(発明の効果)

本発明は如上のように、X線撮影装置でX線撮影を行う際に、患者に咬ませることによって患者の顎部を固定できる歯列の印象を、X線装置に取付ける歯列印象取付具に取付けるに際して使用され、所要の撮影部位が断層面に一致するように、歯列の印象の取付位置、向き、及び角度を所定の状態にすることができる。

従って歯列印象取付具をX線撮影装置に取り付けたとき、これを咬む患者の顎の位置、向き、角度が設定され、歯列印象取付具の取り付け後、希望の撮影部位が断層面に一致するように患者の位置を調整する手数が省略される。

又、この歯列印象を咬むことにより、断層レントゲン撮影、パノラマレントゲン撮影に際し、患者の顎部が動かなくなるので、その移動による撮

影の失敗、再現性の不安定、拡大率の変化等が防止できるものである。

4. 図面の簡単な説明

第1図～第3図はゲージ台の取り付け状態の側面図、正面図、平面図、

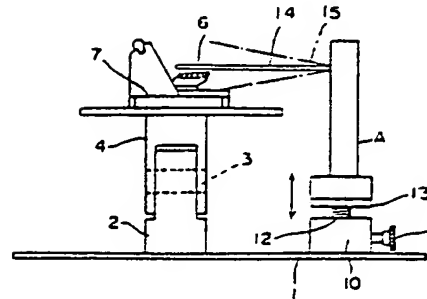
第4図～第6図は歯列印象取付具を取り付けた状態の側面図、正面図、平面図、

第7図、第8図は歯列印象取付具を取り付けて撮影を行う際のレントゲン撮影装置の側面図、正面図、

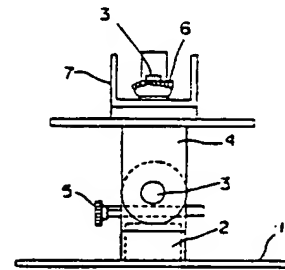
第9図、第10図は歯列印象の取付部を開じた場合と開いた場合の平面図、

第11図は同上の他の形態の平面図である。

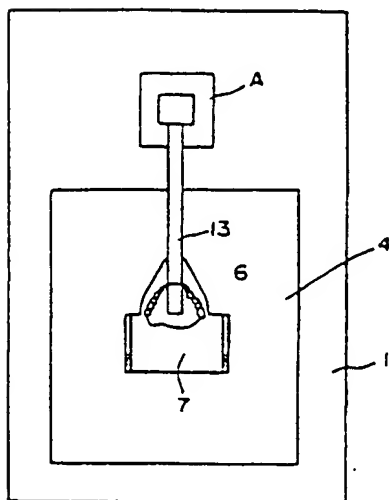
A…ゲージ台、B…歯列印象取付具、C…レントゲン撮影装置、C1…取付部、1…基台、3…軸、4…傾斜基台、6…下顎歯型、7…下歯列固定台、8…上顎歯型、9…上歯列固定台、12…ネジ、13…取付台、14…ゲージ板、15…ビーム光、16…取付板、16a…取付部。



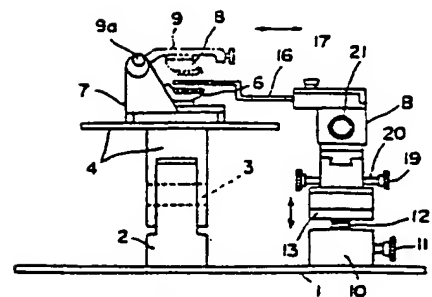
第1図



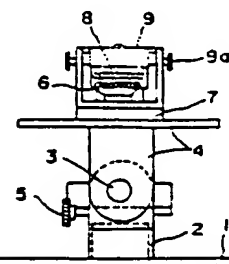
第2図



第3図



第4図



第5図

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(54) METHOD OF ALIGNING PROJECTED SITES

WITH DENTAL IMPRESSION IMAGE AND
DEVICE FOR THE SAME

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Specification

1. Title of Invention

METHOD OF ALIGNING PROJECTIONS WITH DENTAL IMPRESSION AND DEVICE FOR THE SAME

2. Scope of Patent Claim

(1) A method of aligning a projection with a dental impression, characterized in that a dental form that duplicates a row of teeth is attached to an inclinable articulator on a supporting table, the dental form is aligned by an aligning means, such as a beam or indicator line from a gauge table attached to said supporting table, a dental impression that is used in combination with the dental form on said articulator is anchored to a dental impression attachment tool, which has been exchanged with the gauge table and attached to the supporting table, using an anchoring means, such as adhesive, etc., and then this dental impression attachment tool is removed from said supporting table and attached to the tomograph.

(2) A device for aligning a projection with a dental impression, characterized in that it comprises an articulator, which can be anchored at any angle of inclination to a supporting table using a tilting means and to which a dental form that duplicates a row of teeth is attached, a beam emitter that can be attached to and detached from said supporting table and display the

tomographic section plane, a gauge table with an alignment means, such as an indicator line, etc., and a dental form impression attachment tool for attaching a dental impression during tomography to the above-mentioned supporting table in place of said gauge table.

3. Detailed Description of Invention

(Industrial field of application]

The present invention pertains to a method for aligning a projection from a dental image and a device for the same wherein an impression of a row of teeth to be bitten by a patient is attached at a specific position and at a specific angle to a dental impression attachment tool attached to a tomography so that the patient's jaw is held still during tomography.

(Prior art)

The method has been used in the past wherein when tomography is performed, the jaw of the patient is held still by having the patient rest his chin on a table called a chin rest to prevent (illegible), with the ears used as a reference point.

(Problems to be solved by invention)

Nevertheless, because a skin surface on the patient is used as the reference point for this method, the position of the jaw that is being photographed will change if the patient moves and reproducibility of the image will be poor. Moreover, magnification of the patient's position (projected site) will change and there will be an increase in distortions.

Therefore the method was considered whereby using an impression that is an indentation of a row of teeth of a patient, this impression is attached to a supporting table that can move in the X-Y direction, etc., of a device for dental roentgenography using an impression attachment part and the patient is then anchored to the projection position via his teeth and jaw by biting into this impression.

By means of this method, it is necessary for the patient to tilt his jaw and for the direction of the jaw to change with the position and direction of X-ray projection. In order to do this, the dental impression being bitten by the patient must be tilted and its position must be changed with respect to the projector.

An object of the present invention is a method of aligning the projection with a dental impression and a device for the same wherein the dental impression that the patient will bite into is anchored to a specific position (in a specific direction and at a specific angle) with an impression attaching tool attached to the projector and when this is bitten by the patient, the jaw of the patient will naturally incline to a position in a specific direction with respect to the projector when an X-ray is being taken of a jaw of a patient using the above-mentioned impression.

[Means for solving problem]

The present invention pertains to a method of alignment of a section plane position with an impression and a device for the same for realizing the above-mentioned object. This object can be accomplished by a method whereby a dental form that duplicates a row of teeth is attached to an inclinable articulator

on a supporting table, the dental form is aligned by an aligning means, such as a beam or indicator line from a gauge table attached to said supporting table, a dental impression that is used in combination with the dental form on said articulator is anchored to a dental impression attachment tool, which has been exchanged with the gauge table and attached to the supporting table, using an anchoring means, such as adhesive, etc., and then this dental impression attachment tool is removed from said supporting table and attached to the tomograph.

Moreover, the above-mentioned object can be accomplished with a device for this alignment method comprising an articulator, which can be anchored at any angle of inclination to a supporting table using a tilting means and to which a dental form that duplicates a row of teeth is attached, a beam emitter that can be attached to and removed from said supporting table and display the tomographic section plane, a gauge table with an alignment means, such as an indicator line, etc., and a dental form impression attachment tool for attaching a dental impression during tomography to the above-mentioned supporting table in place of said gauge table.

[Examples of the invention]

Next, an example of the present invention will be described with figures.

Figures 1 through 3 show the case where a gauge table is attached to a supporting table. 1 is the supporting table. Tilt base 4 is attached to anchor base 2 so that it can freely tilt, which is anchored to this supporting table, by axle 3. The angle of inclination of tilt base 4 can be set as needed with lug 5.

Mandibular form anchoring table 7 (of the articulator), to which dental form 6 that duplicates the mandibular teeth is anchored, is further anchored onto this tilt base 4, while maxillary form anchoring table 9 (of the articulator), to which maxillary form 8 shown in Figures 4 and 5 is anchored, is attached by hinge 9a to this mandibular form anchoring table 7.

Moreover, whether to use mandibular form anchoring table 7 or maxillary form anchoring table 9 or both is determined by the position to be projected.

On the other hand, attaching table 13 that can be raised or lowered by screw 12, which turns when lug 11 is turned, is placed on anchoring table 10 that is anchored onto supporting table 1. Gauge table A is attached so that it can be attached to and removed from this attaching table 13 as necessary.

Gauge plate 14 with indicator line 14a for aligning the part of the tooth form with the section plane position is on the top front of this gauge table A. Moreover, a light emitter that emits light beam 15 on any line in order to confirm the inclination of the tooth form to the section plane is attached to this gauge table A so that it faces the table.

By means of this gauge table A, attaching table 13 is raised or lowered by screw 12 that turns when lug 11 turns and as a result, the distance between gauge plate 14 and, for instance, mandibular form 6 is adjusted and mandibular form anchoring table 7 is moved on tilt base 4 and its position is set so that a specific part of the tooth form coincides with indicator line 14a that shows the section plane position.

Next, lug 5 is turned and tilt base 4 is inclined so that a specific part of the tooth form is brought to the necessary angle, such as perpendicular, to beam light 15 that will show the section plane.

Thus, once mandibular form 6 has been set at a specific position (specific direction and inclination) with respect to gauge table A (the section plane shown by indicator line 14a and beam light 15), bottom tooth form anchoring table 7 is anchored to tilt base 4.

Once anchoring is completed, lug 11 is turned and gauge table A is removed from attaching table 13.

Moreover, dental impression attachment tool B shown in Figure 4 through figure 6 is attached to attaching table 13 in place of gauge table A.

This dental impression attachment tool B is such that, for instance, attachment plate 16, which attaches the dental impression whose indentation is the opposite of that of mandibular teeth 6, can be attached and removed by operating lug 17.

This attachment plate is preferably one wherein dental impression attachment part 16 a can be spread open to the right and left by axle 18 so that the impression that is inclined can be easily attached, even if mandibular form 6 is inclined, as shown in Figures 9 and 10.

Moreover, it can also have the shape shown in Figure 11.

This attaching plate 16 can be moved to the right and left by screw 20 having lug 19 or to the front and back by screw 22 having lug 21 by turning the lugs of the same.

Consequently, dental impression attachment part 16a of attachment plate 16 can be brought to a position that coincides with mandibular teeth 6 by operating these lugs 19 and 21.

Furthermore, Figures 4 through 6 show the case wherein either maxillary form 8 or mandibular form 6 is attached. They show the impression of maxillary form 8 bonded to the top surface in the case of a maxillary section plane and an impression of mandibular form 6 bonded to the bottom surface (in the case of a mandibular or mandibular joint section plane) by adhesive.

The adhesive is cured and then impression attachment tool B is removed from supporting table 13. This is attached to attaching part C of X-ray equipment C, as shown in Figures 7 and 8.

Moreover, by having a patient bite this impression, the jaw of the patient can be brought to the inclination and direction (position) of mandibular teeth 6 (or) maxillary teeth 8 that has been set on mandibular anchoring table 7 (or) maxillary anchoring table 9 with respect to X-ray generator C2 and its image-receiver C3 of X-ray equipment C.

In addition, C4 is a support bar that the patient holds in order to help him support his body when he is biting the dental impression.

Thus, once the jaw of the patient has been anchored, X-ray generator C2 and its image-receiving device C2 are turned around the jaw and roentgenography is performed in sections during this turning to obtain roentgenograms of different section planes.

In addition, there is a scale of the front and back and right and left positions of impression attaching tool 16 that have been set by lugs 19 and 21 and therefore, it is possible to reproduce conditions, such as the projection position, etc., at any time by storing impression attaching part 16a with these numbers and the impression.

In addition to anchoring the jaw in dentistry, as previously mentioned, the present invention can be used for alignment (in the direction of the section plane to be imaged) based on the correlation between the mandibular joint or nose and the row of teeth and therefore, it can be used for tomography and panography of the teeth as well as mandibular joint and in otology, etc.

[Results of invention]

As previously explained, the present invention makes it possible to bring an impression of a row of teeth, which can be used to anchor the position of the patient when the patient bites the same, to a specific position in a specific direction and at a specific angle so that it coincides with the section plane of a specific part to be imaged when a dental impression is attached to a dental impression attaching tool attached to X-ray equipment and X-rays are taken with X-ray equipment.

Consequently, when the dental impression attachment tool is attached to the X-ray equipment, the position, direction and angle of the jaw of the patient biting the impression are set and then the position of the patient is adjusted so that the projection site coincides with the section plane of the patient after the impression attachment tool has been attached.

In addition, in the case of tomography or panoramic tomography, the jaw of the patient does not move because the impression is being bitten and therefore, there is no distortion of the image, instability of reproducibility, or changing of magnification.

4. Brief Description of Figures

Figures 1 through 3 are a side view, front view and top view of the gauge table when attached,

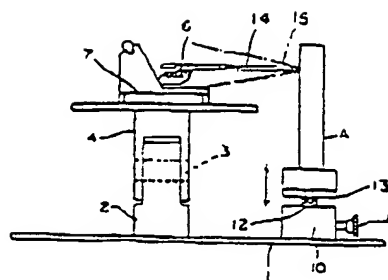
Figures 4 through 6 are a side view, front view and top view of the dental impression attachment tool when attached,

Figures 7 and 8 are a side view and front view of the imaging device when roentgenograms are made with the dental impression tool attached,

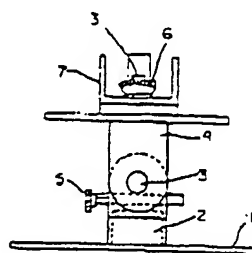
Figures 9 and 10 are top view when the dental impression attachment part is closed and when it is opened, and

Figure 11 is a section plane view of another embodiment.

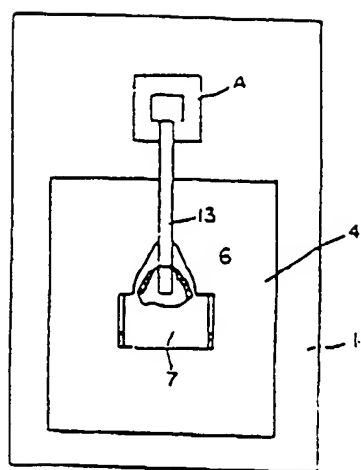
A is the gauge table, B is the dental impression attachment tool, C is the X-ray equipment, C1 is the attachment part, 1 is the base, 3 is the axle, 4 is the tilt base, 6 is the mandibular form, 7 is the mandibular tooth anchoring table, 8 is the maxillary form, 9 is the maxillary tooth anchoring table, 12 is a screw, 13 is the attaching table, 14 is the gauge plate, 15 is the beam light, 16 is the attachment plate, and 11a is the attachment part.



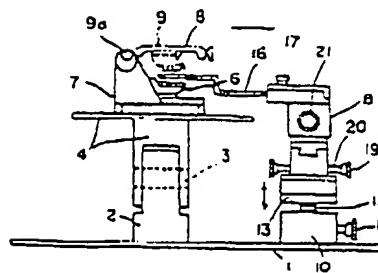
第 1 图



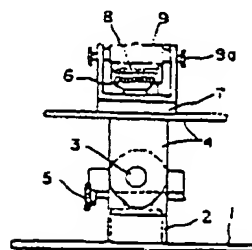
第 2 图



第 3 图



第 4 图



第 5 图